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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/788,588

02/27/2004

Omid Oliaei

MOTB:036US

6824

7590

08/29/2005

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EXAMINER

NGUYEN, LINH V

ART UNIT

PAPER NUMBER

2819

DATE MAILED: 08/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/788,588	OLIAEI, OMID	
	<b>Examiner</b>	<b>Art Unit</b>	
	Linh V. Nguyen	2819	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 February 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>2/27/04</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

1. This office action is in response to application No. 10/788,588. Claims 1 - 17 are pending on this application.

### ***Specification***

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2, 5 - 7 – 13 are rejected under 35 U.S.C. 102(e) and 102(a) as being anticipated by Yang et al. U.S. Patent No. 6,538,592.

Regarding claim 1, Fig. 1 of Yang et al. discloses a complex (Col. 4 line 30 discloses a complex signal I and Q) Sigma-delta modulation (22) method, comprising: receiving a complex input signal (12) having a real component (I as disclosed on Col. 4 line 30 above) and an imaginary component (Q as disclosed on Col. 4 line 30 above); applying a first complex sigma-delta modulation process (22) to the complex input signal (12) to produce a first sigma-delta modulated signal (30); applying a second complex sigma-delta modulation process (52) to the first sigma-delta modulated signal (30, also see Fig. 3) to produce a second sigma-delta modulated sigma (70); and conditioning the first and second sigma-delta modulated signals (30, 70) using a complex noise cancellation process (48, 98, 100, 110, 120, 130) to produce an output signal (output of 130).

Regarding claim 2, wherein first and second complex the sigma-delta modulation (22, 52) processes each comprising multiple-order sigma-delta modulation processes (Col. 4 lines 19 – 23).

Regarding claim 5, the analog to digital converter of Yang et al. as applied to claim 1 above, disclosed every aspect of applicant claim invention.

Regarding claim 6, wherein the first and second sigma-delta modulators (22, 52) including real integrators (Fig. 3).

Regarding claim 7, the analog-to-digital converter of claim 5, the first complex sigma-delta modulator comprising a multiple-order sigma-delta modulator circuit (Fig. 3).

Regarding claim 8, wherein the multiple-order sigma-delta modulator circuit including real integrators (Fig. 3).

Regarding claim 9, wherein the second complex sigma-delta modulator comprising a multiple-order sigma-delta modulator circuit (Fig. 3).

Regarding claim 10, wherein the multiple-order sigma-delta modulator circuit including real integrators (Fig. 3).

Regarding claim 11, Fig. 1 of Yang et al. discloses complex modulator, comprising: an input for receiving a base band input signal (12) having a real ( I component as disclosed on Col. 4 line 30) and an imaginary component a complex analog-to-digital converter (10) for converting one of the real and imaginary components of the input signals (12) into a quantized real output signal and a quantized imaginary output signal (102); and a complex digital filter 110, 130) for filtering the complex real and imaginary output signals to produce a real filtered output signal (output of 130).

Regarding claim 12, wherein, the complex analog-to-digital converter (10), comprising: a first complex sigma-delta modulator (22) for converting the one of the real and imaginary components of the input signal to produce a first sigma-delta modulated output signal (70); and a second complex sigma-delta modulator (52; also see fig. 3) coupled to the first complex sigma- delta modulator (22), for converting the first sigma-delta modulated signal (70; see fig. 3) into the quantized real output signal and the quantized imaginary output signal (70).

Regarding claim 13, Yang et al. further discloses a radio frequency signal receiver for producing the baseband input signal (Col. 1 lines 17 – 22).

5. Claim 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Swaminathan et al. U.S. Patent No. 6,329,939.

Fig. 7 of Swaminathan et al. disclose a radio frequency receiver, comprising: an input (antenna) for receiving a modulated radio frequency signal; a down converter (mixers) coupled to the input for converting the modulated radio frequency signal into a baseband input signal (output of mixers) having real and imaginary components; a complex sigma-delta analog to digital converter (300) coupled to the down converter, for converting only one of the real and imaginary components of the input signal into a complex digitized output signal (236, 238); a complex digital filter (312, 314) coupled to the complex sigma-delta analog to digital converter, for producing a real filtered output signal from the complex digitized output signal.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3, 4, 14 - 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swaminathan et al. U.S. Patent No. '939' as applied to claim 17 above, and in view of Yang et al. '592' as applied to claim 1 above.

Fig. 7 of Swaminathan et al. discloses a radio frequency receiver, comprising: an input for receiving a modulated radio frequency signal (antenna); a down converter (mixer) coupled to the input for converting the modulated radio frequency signal into an input signal having real and imaginary components; an sigma- delta analog to digital converter (300) coupled to the down converter, and a complex digital noise cancellation circuit (236, 238) coupled to the output of the sigma delta converter for canceling quantization noise and for producing a digitized output signal. However, Swaminathan et al. fails to discloses the sigma-delta (300) comprising: a first stage including a complex sigma-delta modulator and having a first stage output; and a second stage coupled to the output of the first stage complex sigma delta modulator to produce a second stage output.

Fig. 1 of Yang et al. discloses sigma-delta modulator (10) of wireless receiver system having a first stage (22) including a complex sigma-delta modulator (Fig. 3) and having a first stage output (70); and a second stage (52) coupled to the output of the first stage including a complex sigma delta modulator (Fig. 3) to produce a second stage output (70); a complex digital noise cancellation circuit coupled to the outputs of the sigma-delta modulator (100, 98, 110, 120, 130) to canceled noise and producing a digital output signal (output of 130).

Swaminathan et al. and Yang et al. are common subject matter for down conversion with sigma-delta analog to digital converter. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made in modify the sigma-delta modulator of Swaminathan et al. with the sigma-delta modulator

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taught by Yang et al. for the purpose of providing high conversion dynamic range, better enable subsequent rejection of the interference tone, and reduction of power consumption for mobile devices (Yang et al. Col. 1 line 66 – Col. 2 lines 10)

***Prior Art***

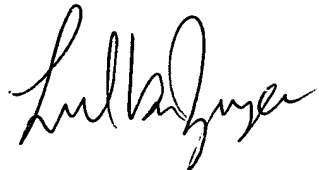
7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

***Contact Information***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Linh Van Nguyen whose telephone number is (571) 272-1810. The examiner can normally be reached from 8:30 – 5:00 Monday-Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Robert Pascal can be reached at (571) 272-1769. The fax phone numbers for the organization where this application or proceeding is assigned are (571-273-8300) for regular communications and (571-273-8300) for After Final communications.

08/24/05

Linh Van Nguyen

A handwritten signature in black ink, appearing to read 'Linh Van Nguyen', written in a cursive style.

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